

Synthesis and characterization of alkyd resins using blend of soya bean oil and karawila seed oil

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Abstract

This research is based on synthesizing an air drying long oil alkyd resin using a blend of semi drying soya bean (*Glycine max* -Pb I) oil and fast drying karawila (*Momodica charantia* -MC43) seed oil. The alkyd resin was synthesized with the aim of obtaining a varnish without standing film properties, especially drying characteristics enhance by significant amount of α -eleostetic acid (ctt,9,11,13-18:3), where is having conjugated double bonds, presence in karawila seed oil.

A series of alkyd resins were prepared maintaining 65% oil length by changing the ratio of karawila seed oil from 0-50% (by w/w%). The other constituents of alkyd resins were pentaerythritol, phthalic anhydride, xylene and sodium methoxide as catalyst. Due to the low acid values of the seed oils monoglyceride process was selected and obtained acceptable standard for transesterification and polyesterification reactions and 240°C temperature was maintained at transesterification and esterification stages. Patton constant and the ratio of OH:COOH groups were maintained closer to 1.00 when preparing alkyd resins. In addition, the alkyd resins were prepared by maintaining final acidity value below 20 mg/g to make sure the extent of polymerization was in the range of 90 % to 95 %. Physicochemical properties of these alkyd resin solutions were examined to see the effect with the increase of karawila seed oil in the resin. The solid content was adjusted to 50% and cobalt octate with lead octate were used as driers to prepare varnish from these alkyd resins. The film properties of the alkyd resins were examined to find the optimum ratio of karawila oil to soya bean oil. Mechanical properties, chemical resistant properties and drying properties of these films were examined and evaluated in this regard

The alkyd resin blended with 30% karawila seed oil showed the best film properties in the oil blended series and it also rendered lower set to touch drying time and dry to touch drying time, better scratch hardness, adhesion and better gloss. In addition, better resistance to water, acid, solvent and corrosion was observed